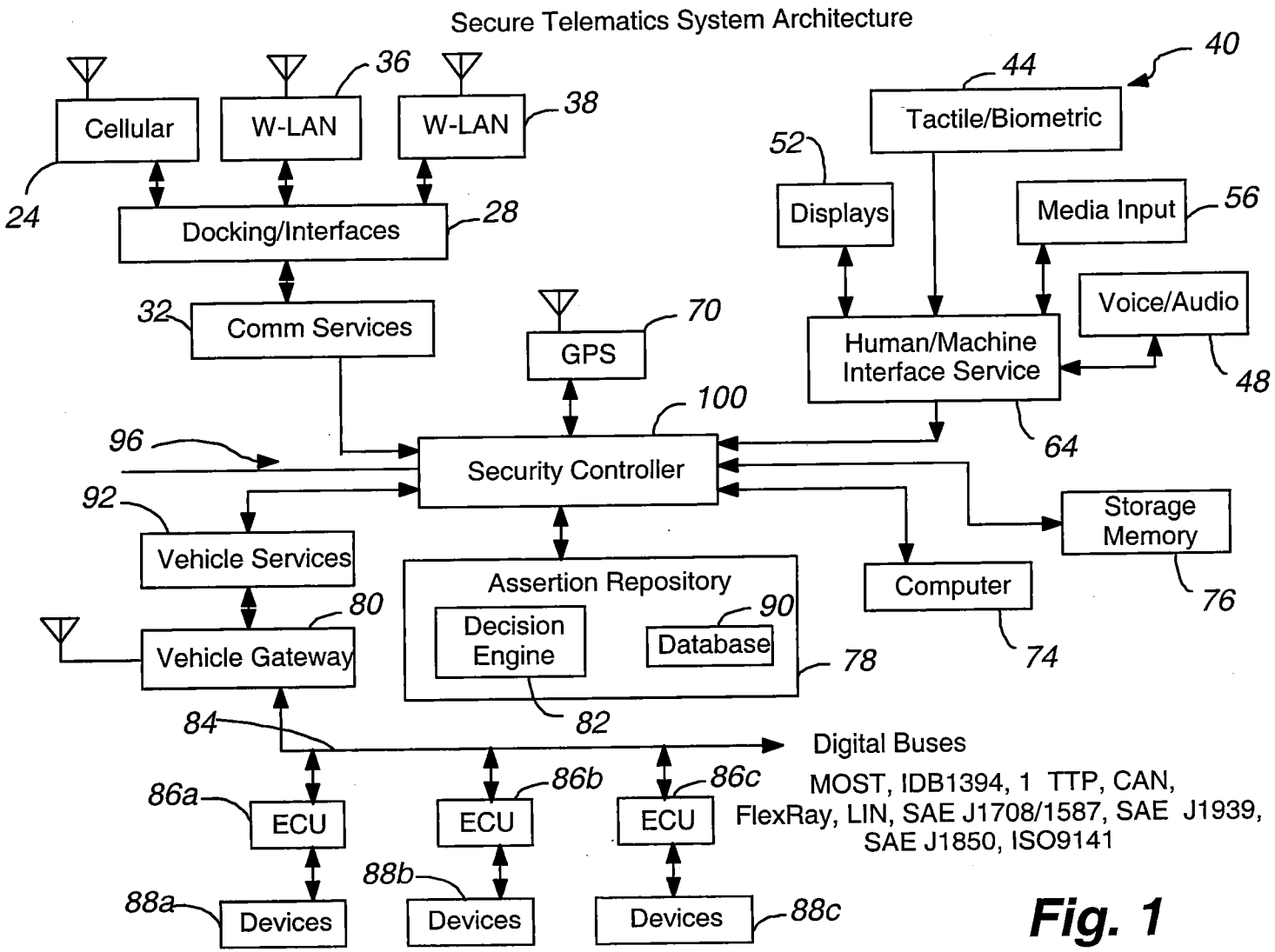

Secure Telematics System Architecture
Cellular
W-LAN
W-LAN
36
38
24
Docking/Interfaces
28
32
Comm Services
GPS
70
100
96
Security Controller
92
Vehicle Services
80
Vehicle Gateway
Assertion Repository
Decision Engine
Database
90
78
82
84
Digital Buses
86a
86b
86c
ECU
ECU
ECU
88a
88b
88c
Devices
Devices
Devices
MOST, IDB1394, 1 TTP, CAN,
FlexRay, LIN, SAE J1708/1587, SAE J1939,
SAE J1850, ISO9141
Tactile/Biometric
44
40
52
Displays
Media Input
56
Voice/Audio
48
Human/Machine Interface Service
64
Storage Memory
76
Computer
74

Fig. 1

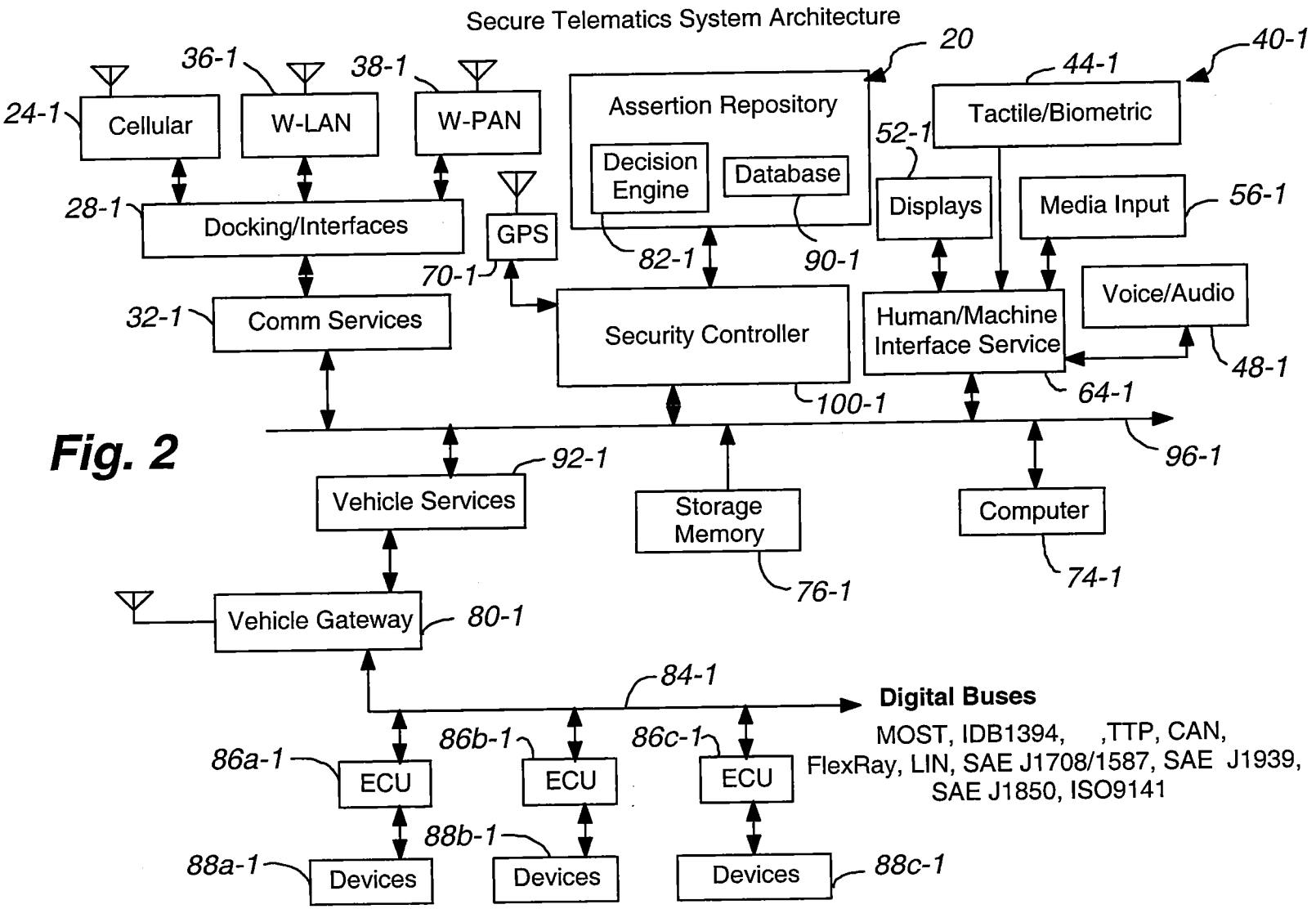
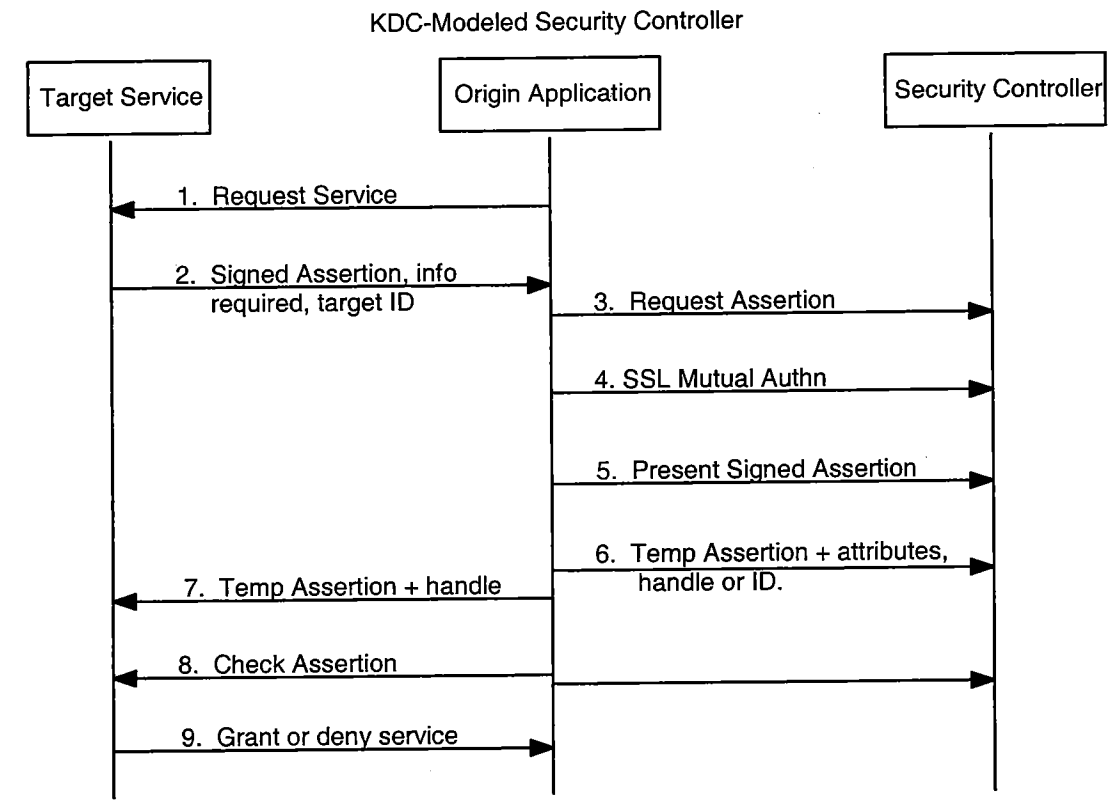

Secure Telematics System Architecture
20
36-1
38-1
40-1
44-1
24-1
Cellular
W-LAN
W-PAN
Assertion Repository
Decision Engine
Database
Tactile/Biometric
52-1
28-1
Docking/Interfaces
GPS
Displays
Media Input
56-1
82-1
90-1
70-1
Voice/Audio
32-1
Comm Services
Security Controller
Human/Machine Interface Service
48-1
64-1
100-1
96-1
92-1
Vehicle Services
Storage Memory
Computer
76-1
74-1
Vehicle Gateway
80-1
84-1
Digital Buses
MOST, IDB1394, ,TTP, CAN, FlexRay, LIN, SAE J1708/1587, SAE J1939, SAE J1850, ISO9141
86a-1
86b-1
86c-1
ECU
ECU
ECU
88b-1
88a-1
Devices
Devices
Devices
88c-1

Fig. 2



Flows between the Origin and Target may need to be encrypted to protect against "man-in-the middle" attacks.

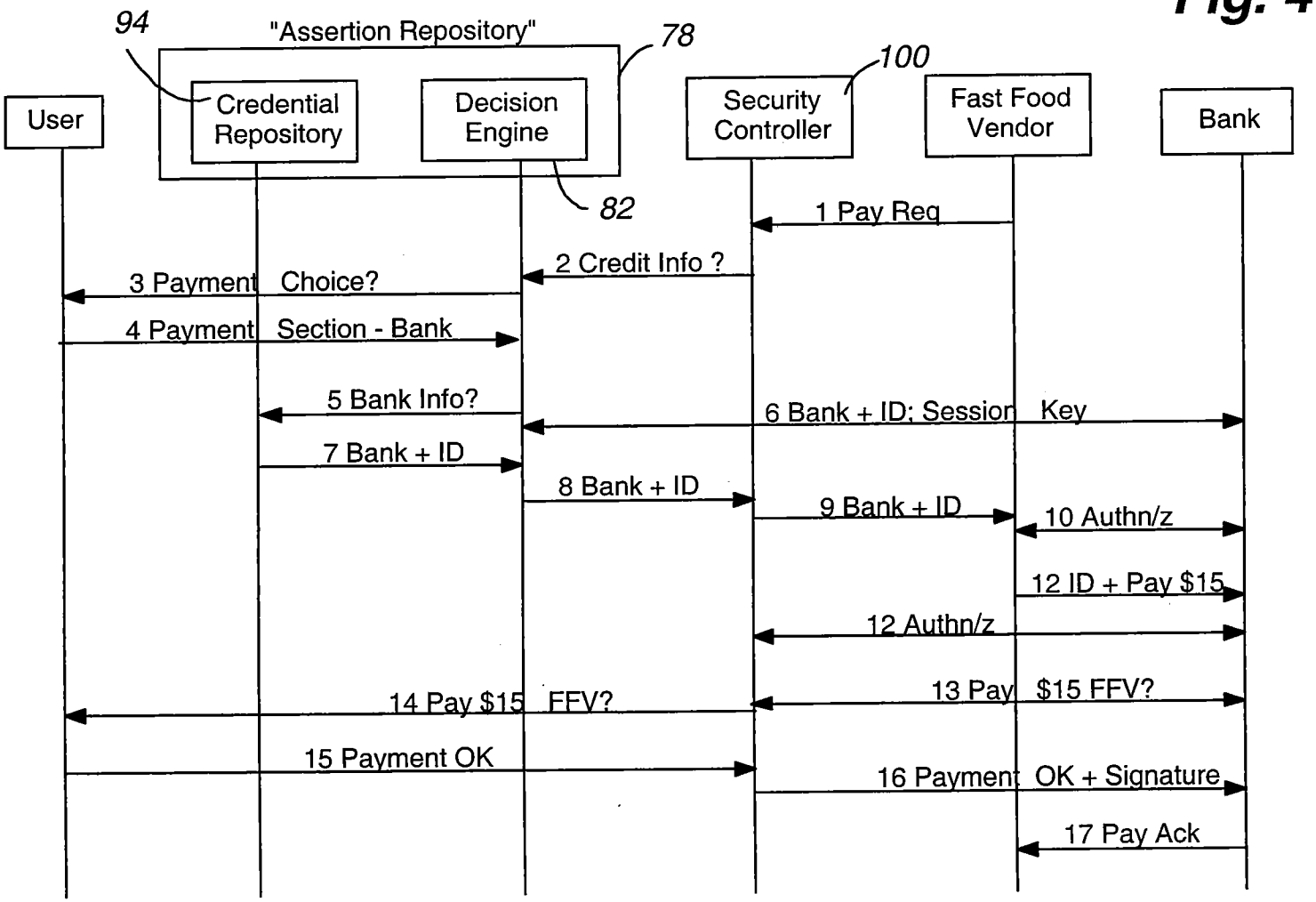
The Origin Application may remain anonymous to the Target Services throughout the transaction.

The assertion check in step 8 could be done against the Security Controller's PKC, eliminating the need for Target Service to Security Controller communication.

Fig. 3

Anonymous Drive-through Payment

Fig. 4



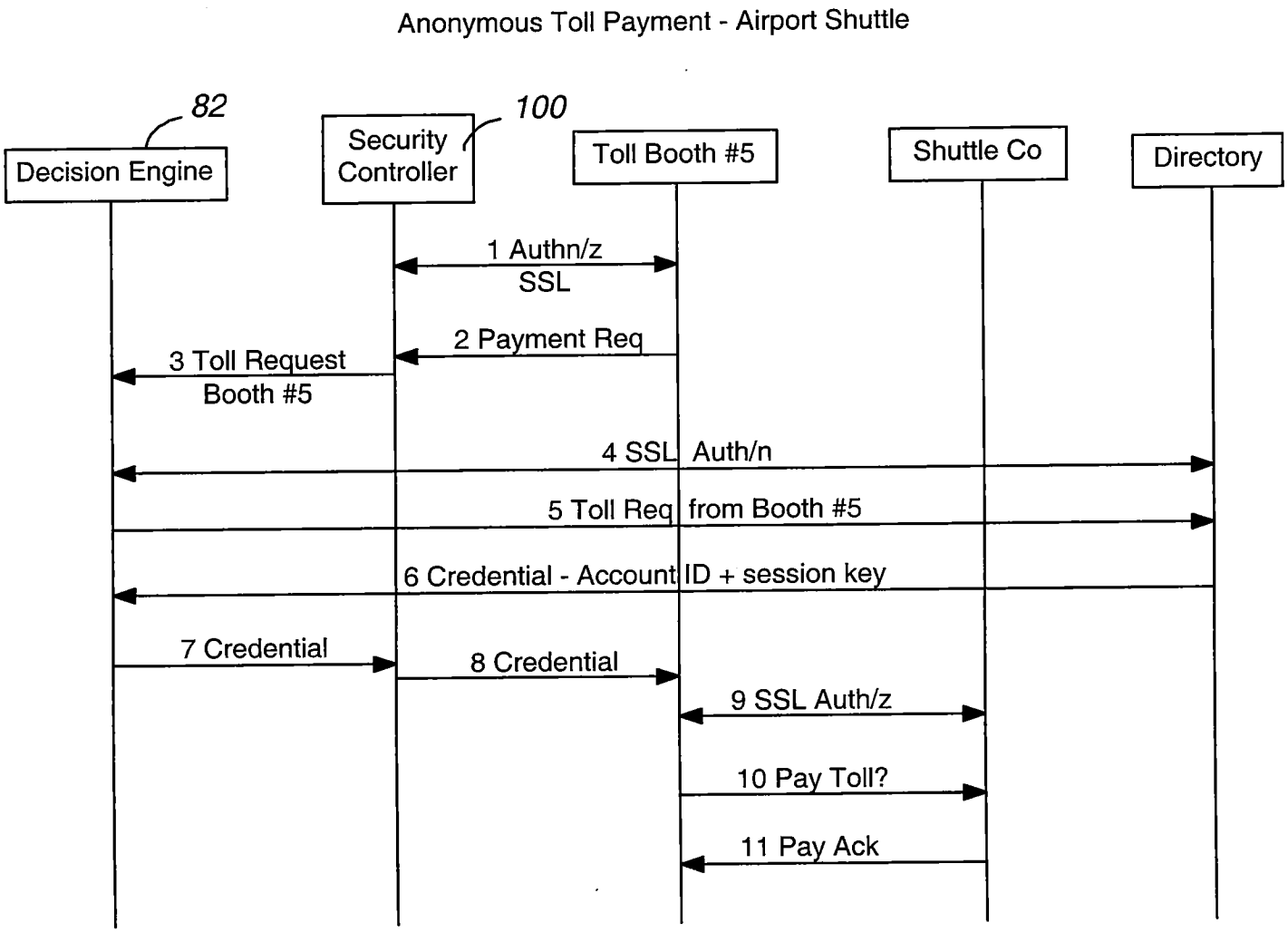

Anonymous Toll Payment - Airport Shuttle
82
100
Decision Engine
Security Controller
Toll Booth #5
Shuttle Co
Directory
1 Authn/z SSL
2 Payment Req
3 Toll Request Booth #5
4 SSL Auth/n
5 Toll Req from Booth #5
6 Credential - Account ID + session key
7 Credential
8 Credential
9 SSL Auth/z
10 Pay Toll?
11 Pay Ack

Fig. 5

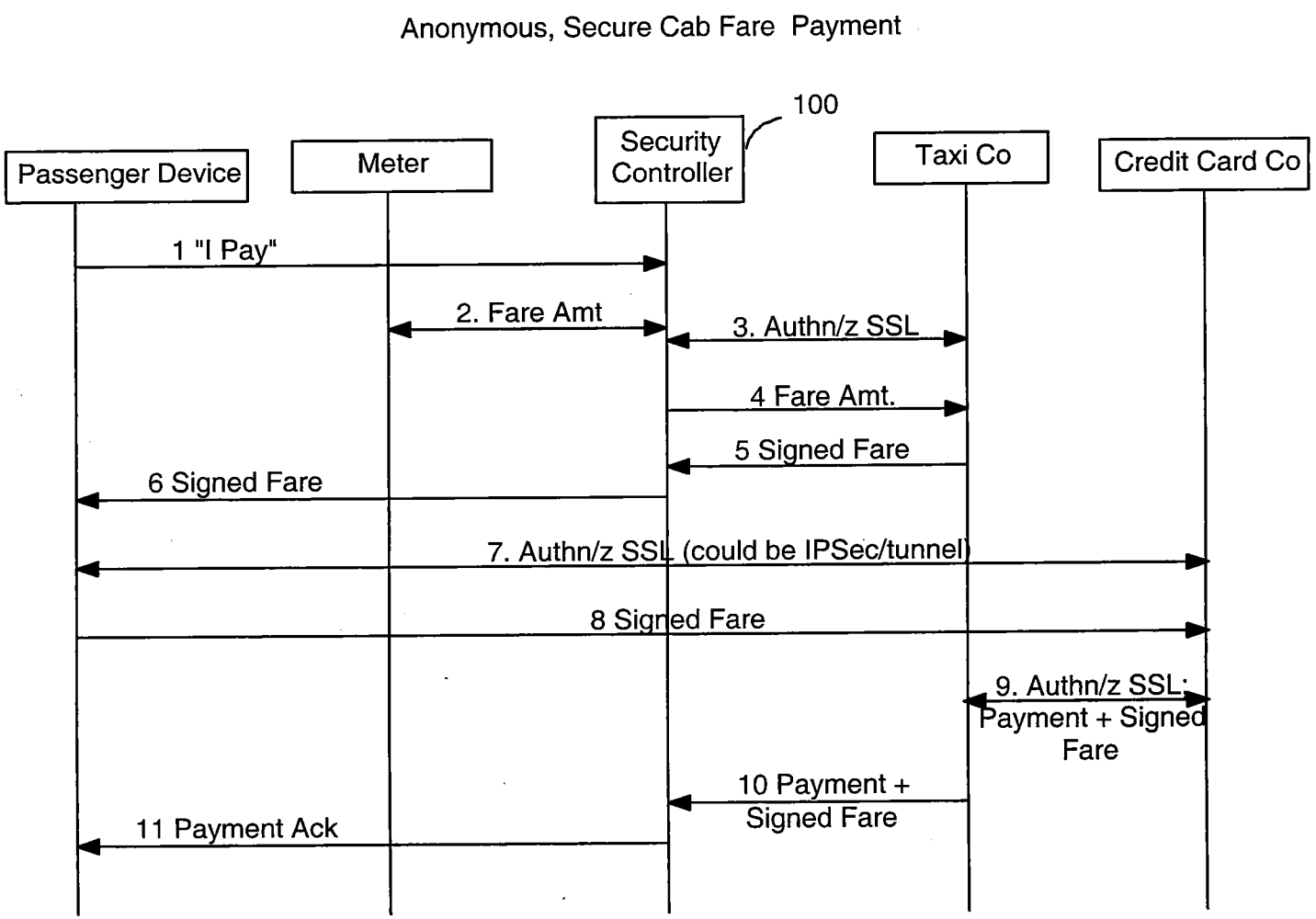

Anonymous, Secure Cab Fare Payment
100
Passenger Device
Meter
Security Controller
Taxi Co
Credit Card Co
1 "I Pay"
2. Fare Amt
3. Authn/z SSL
4 Fare Amt.
5 Signed Fare
6 Signed Fare
7. Authn/z SSL (could be IPSec/tunnel)
8 Signed Fare
9. Authn/z SSL: Payment + Signed Fare
10 Payment + Signed Fare
11 Payment Ack

Fig. 6

Secure Vehicle Location Access

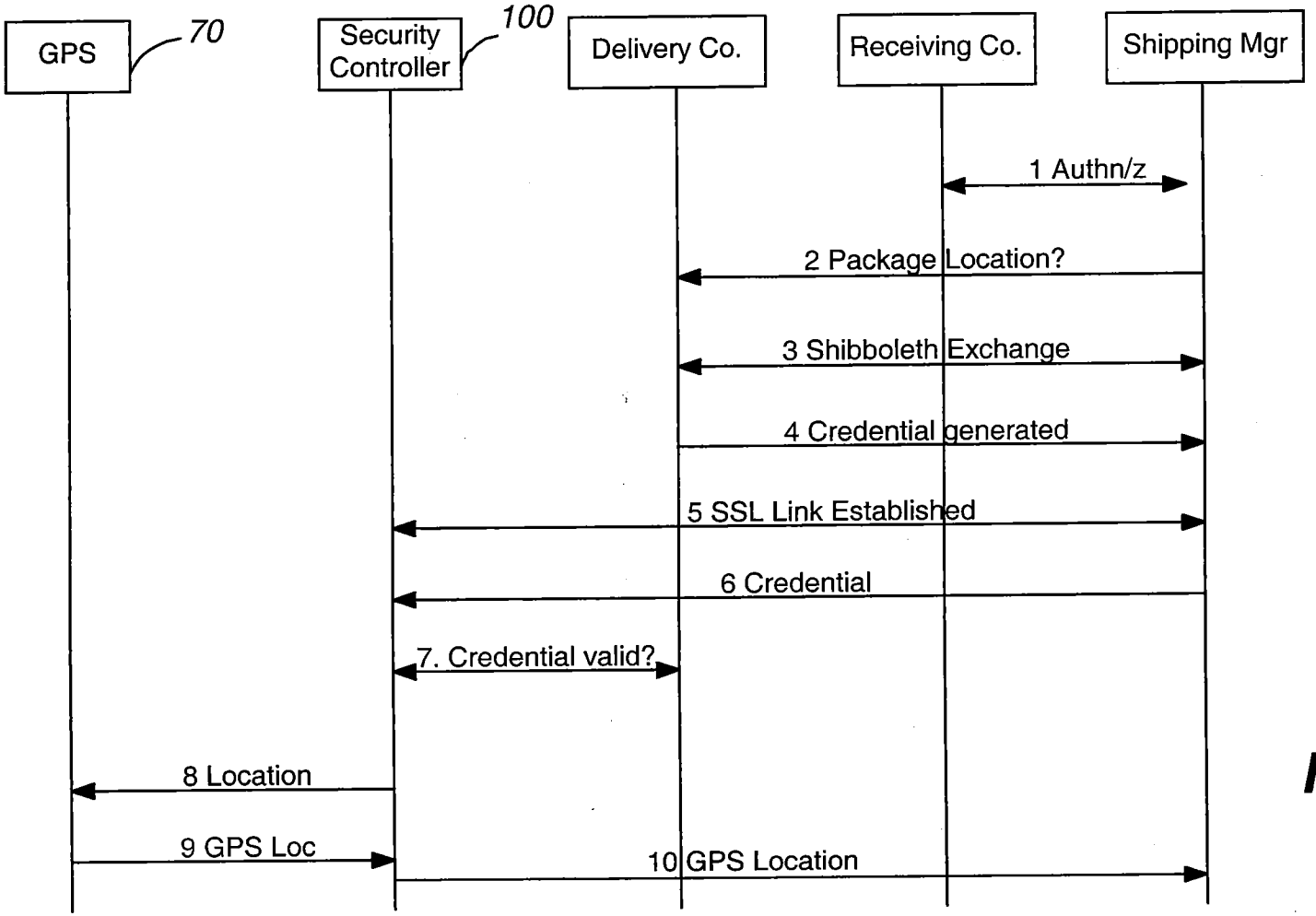


Fig. 7

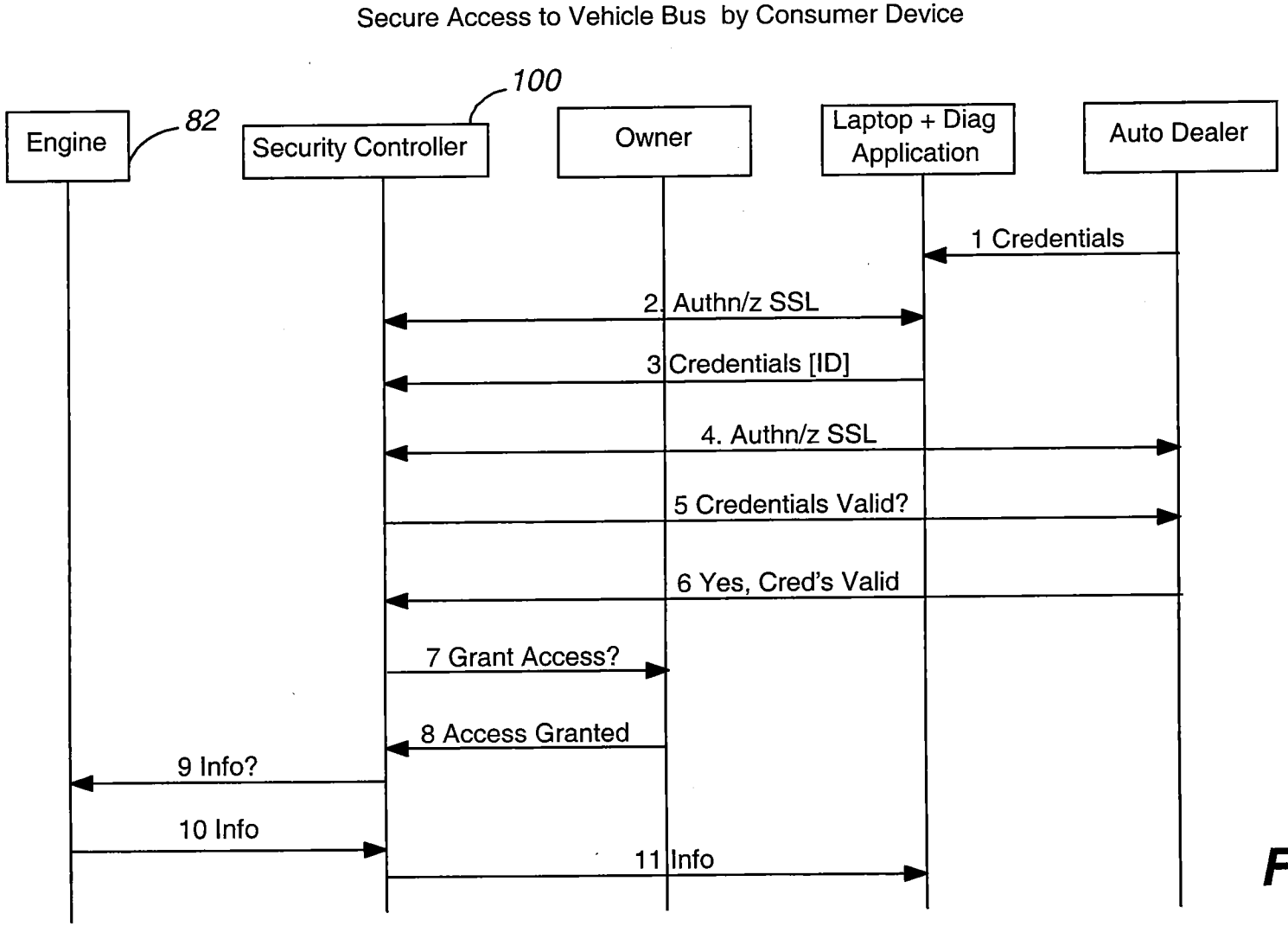

Secure Access to Vehicle Bus by Consumer Device
100
82
Engine
Security Controller
Owner
Laptop + Diag Application
Auto Dealer
1 Credentials
2. Authn/z SSL
3 Credentials [ID]
4. Authn/z SSL
5 Credentials Valid?
6 Yes, Cred's Valid
7 Grant Access?
8 Access Granted
9 Info?
10 Info
11 Info

Fig. 8